

## CLAIMS

We Claim:

1. A network comprising a plurality of Nodes interconnected by Links, wherein:
  - (a) each Node is assigned a set of one or more coordinate labels, each representing a path comprising one or more Links or other Nodes;
  - (b) at least one of said set of one or more coordinate labels is additionally comprised of service information;
  - (c) each coordinate label is unique to the Node to which it is assigned; and
  - (d) a path between a first Node and a second Node being determined from one of said coordinate labels associated with said first Node and one of said coordinate labels associated with said second Node.
2. The network of claim 1 wherein one or more of said set of one or more coordinate labels is changed after a predetermined or random interval of time.
3. The network of claim 1 wherein said service information includes a bandwidth for at least one of said one or more Links.
4. The network of claim 1 wherein said service information includes a bandwidth for at least one of said plurality of Nodes.
5. The network of claim 1 wherein said service information includes a cost metric.

6. The network of claim 1 wherein said service information includes a delay metric.

7. The network of claim 1 wherein said service information includes a physical distance metric.

8. The network of claim 1 wherein said service information includes a load metric.

9. The network of claim 1 wherein said service information includes Quality of Service information.

10. The network of claim 1 wherein said service information includes a Link security classification.

11. The network of claim 1 wherein said service information is comprised of information for balancing a data load on said network.

12. The network of claim 1 wherein said service information is comprised of information for controlling a flow of data on said network.

13. The network of claim 1 wherein said service information is comprised of information for diagnosing and repairing a problem on said network.

14. The network of claim 1 wherein said service information is comprised of information controlling access to a payload of said data.

15. A network comprising a plurality of Nodes interconnected by Links, wherein:

(a) each Node is assigned a set of one or more coordinate labels, each representing a path comprising one or more Links or other Nodes;

(b) each coordinate label is unique to the Node to which it is assigned;

(c) at least one path between a first Node and a second Node being determined from one of said coordinate labels associated with said first Node and one of said coordinate labels associated with said second Node;  
and

(d) a preferred path between said first Node and said second Node is selected from a set of one or more possible paths based upon a predetermined routing objective.

16. The network of claim 15 wherein said predetermined routing objective is to maximize a bandwidth of a routing path.

17. The network of claim 15 wherein said predetermined routing objective is to maximize a bandwidth of a routing Node.

18. The network of claim 15 wherein said predetermined routing objective is to maximize a bandwidth of a routing Link.

19. The network of claim 15 wherein said predetermined routing objective is to minimize a routing path cost.

20. The network of claim 15 wherein said predetermined routing objective is for said path to use a given optical wavelength.
21. The network of claim 20 wherein said routing path cost is measured in a number of said one or more Links comprising said path between said first Node and said second Node.
22. The network of claim 15 wherein said predetermined routing objective is to minimize a physical distance.
23. The network of claim 15 wherein said predetermined routing objective is to minimize a routing load.
24. The network of claim 15 wherein said predetermined routing objective is to minimize a routing path delay.
25. The network of claim 15 wherein said predetermined routing objective is to assure a level of security.
26. The network of claim 15 wherein said predetermined routing objective is to ascertain a security level of said preferred path.
27. The network of claim 15 wherein said predetermined routing objective is to assure a level of Quality of Service.
28. The network of claim 27 where said level Quality of Service is determined based on a need of a user.

29. The network of claim 15 wherein said predetermined routing objective is to minimize a delay in accessing one of said plurality of Nodes.

30. The network of claim 15 wherein said predetermined routing objective is to balance a load among different paths to access one of said plurality of Nodes.

31. A method for determining a path from a source Node to a destination Node in a network comprising a plurality of Nodes interconnected by Links, said Nodes including a first Node, and a plurality of second Nodes, said second Nodes including said source Node and destination Node, said method comprising the steps of:

- (a) assigning to each of said second Nodes, including said source Node and said destination Node, one or more coordinate labels, each coordinate label assigned to a second Node representing a path through said network from said second Node to said first Node;
- (b) including in at least one of said one or more coordinate labels service information; and
- (b) determining a path from said source Node to said destination Node by combining one coordinate label of said source Node and one coordinate label of said destination Node.

32. The method of claim 31 wherein said service information contains information for balancing a data load on said network.

33. The method of claim 31 wherein said service information is comprised of information for controlling a flow of data on said network.
34. The method of claim 31 wherein said service information is comprised of information for diagnosing and repairing a problem on said network.
35. The method of claim 31 wherein said service information is comprised of information for controlling access to a payload of said data.
36. A Node for use in a network, said network comprising a plurality of Nodes connected by Links, wherein:  
said Node for use in said network has one or more coordinate labels assigned thereto, each coordinate label representing a path from said Node to a particular other Node of said network, and where at least one of said one or more coordinate labels is further comprised of service information, each of said coordinate labels being unique to said Node.
37. The Node of claim 36 wherein said service information is comprised of information for balancing a data load on said network.
38. The Node of claim 36 wherein said service information is comprised of information for controlling a flow of data on said network.
39. The Node of claim 36 said service information is comprised of information for diagnosing and repairing a problem on said network.

40. The Node of claim 36 wherein said service information is comprised of information for controlling access to a payload of said data.